Space Weather Forecast

Issued on Thursday, 27 October 2022 at 13:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of G1/Minor geomagnetic storms throughout. Chance of Minor (R1) Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been Low. The most active sunspot region on the disc was a small region in the northeast, with an increase observed in the number of intermediate spots it has. The most developmental region, however was in the southwest, where a small but compact sunspot group increased in size. This has a north-south aligned magnetic field, which can aid in creating instability, but currently remains relatively simple in terms of its magnetic structure. The largest sunspot region, however, is a further magnetically simpler region in the northeast, near the previously noted active spot. A coronal mass ejection (CME) was observed on the Earth-Sun line, and this has been associated with a filament eruption from the far south of the Sun. A full analysis has yet to be completed, however any material released is currently expected to pass to the south and well below the Earth's orbit. No other Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: The solar wind have largely been at background with speeds below 400 km/s. Total magnetic field strength was weak, with the north-south component also weak at variable, but generally negative (Southward pointed). Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with a chance (30%) of Moderate class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Coronal hole fast wind enhancements are expected through the period. The first of these day 1 or early day 2 (27th or 28th) from a small coronal hole currently in the northwest disc. A more notable enhancement is then expected from the larger more central-disc located coronal hole, most likely day 3 (29th), with fast winds persisting day 4 (30th). Quiet to Unsettled geomagnetic activity will become enhanced at times through the period, giving spells of Active with a chance of G1/Minor Storms, most likely day 3 (29th) but possible throughout the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	30	40	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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